NON-PUBLIC?: N
ACCESSION #: 9401120202
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Nine Mile Point Unit 2 PAGE: 1 OF 5

DOCKET NUMBER: 05000410

TITLE: Reactor Scram Caused by a Turbine Trip Resulting From an Equipment Failure
EVENT DATE: 12/04/93 LER #: 93-012-00 REPORT DATE: 12/30/93

OTHER FACILITIES INVOLVED: N/A DOCKET NO: 05000

OPERATING MODE: 1 POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: Mr. Raymond J. Dean, Technical Support Manager NMP2 TELEPHONE: (315) 349-4240

COMPONENT FAILURE DESCRIPTION:
CAUSE: X SYSTEM: TJ COMPONENT: FS MANUFACTURER: D245
REPORTABLE NPRDS: Y

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

At 2018 hours on December 4, 1993, Nine Mile Point Unit 2 (NMP2) experienced an Engineered Safety Feature actuation. Specifically, an automatic reactor scram occurred caused by a turbine generator trip. At the time of the event, the reactor mode switch was in the "RUN" position (Operational Condition 1) with the plant operating at approximately 100 percent of rated thermal power.

The root cause of this event was equipment failure, which caused a generator runback and turbine trip.

The immediate corrective action was to respond to the reactor scram and turbine trip in accordance with plant operating procedures. Follow up corrective actions included: 1) determining the cause for the turbine trip; 2) replacing the faulty flow switch; 3) checking flow switch

calibration every 18 months; 4) attempting to isolate the source of the foreign material in the failed component; and 5) sampling Stator Water for filterable impurities periodically.

END OF ABSTRACT

I. DESCRIPTION OF EVENT

At 2018 hours on December 4, 1993, Nine Mile Point Unit 2 (NMP2) experienced several Engineered Safety Feature actuations. Specifically, an automatic reactor scram occurred caused by a turbine generator trip. At the time of the event, the reactor mode switch was in the "RUN" position (Operational Condition 1), with the plant operating at approximately 100 percent of rated thermal power.

At 1949 hours on December 4, 1993, the operators commenced Preventive Maintenance Procedure N2-PM-W004, "Weekly Test of Auto Start Feature for the TML, TMB, GMC, and GMO Pumps." Step 6.5.5 of this procedure causes an automatic start of Stator Water Cooling (GMC) pump 2GMC-P1B. When the pump started, flow switch 2GMC-PDS100 malfunctioned, causing a low GMC now indication and an automatic turbine generator runback. The automatic runback reduces main generator output current. Generator current must be less than 24,551 amps within 2 minutes and less than 7,006 amps within 3.5 minutes to prevent a turbine trip. At the same time, the licensed reactor operator was reducing reactor power by reducing Reactor Recirculation System (RCS) flow. Generator current could not be lowered below 7,006 amps within 3.5 minutes and at 2018 hours a turbine trip signal was generated. As the Turbine Stop Valves and Turbine Control Valves shut, the Reactor Protection System (RPS) generated an automatic reactor scram signal and all control rods fully inserted.

At the time of the scram, reactor power had been lowered to approximately 55 percent of rated thermal power. The resultant transient dropped reactor vessel water level to approximately 145 inches, causing the operators to enter the Emergency Operating Procedures. Feedwater level control recovered reactor vessel water level into the normal band and the Emergency Operating Procedures were exited.

II. CAUSE OF EVENT

The cause of the event has been determined to be equipment failure. Troubleshooting commenced shortly after the plant was stabilized. The output from flow switch 2GMC-PDS100 was compared with its associated flow indicator 2GMC-FT100. The flow indication was normal but the flow switch

still indicated low flow. An attempt was made to check the calibration of the flow switch, but was initially unsuccessful. The equalizing port was cycled several times to allow flow through the switch, which caused the switch to commence working again. Upon removal and inspection of the flow switch, foreign material was observed in the process ports of the switch. Apparently, the start of the second cooling water pump caused contaminants within the process portion of the switch to plug one of the process ports, which in turn caused the erroneous low flow indication. The failure of the switch to reset has been attributed to the infrequent cycling of the switch (the switch was

II. CAUSE OF EVENT (cont.)

calibrated once every six years). After repeated cycling, the switch appeared to free itself and operate properly.

III. ANALYSIS OF EVENT

This event is reportable in accordance with 10CFR50.73 (a)(2)(iv), "any event or condition that resulted in a manual or automatic actuation of any engineered safety feature (ESF), including the reactor protection system (RPS)." The automatic reactor scram was actuated by a trip of the RPS.

The turbine trip was a protective action for the main generator. Without Stator Water Cooling flow, the generator can be operated for one hour with a maximum load of 7,006 stator amps. If the turbine runback does not reduce load quickly enough, the turbine will trip. Operating experience at NMP2 shows that generator load cannot be lowered quick
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enough to prevent the turbine trip and resultant reactor scram. The reactor scram is required to limit the power and pressure peak after the turbine trip. This event is bounded by the analysis discussed in the NMP2 Updated Safety Analysis Report (USAR) section 15.2.3, "Turbine Trip."

This event had no adverse affect on any other safety systems nor the operators' ability to maintain safe reactor plant conditions. The reactor scram in no way affected the health and safety of the general public or plant personnel.

The event, from initiation of the turbine runback to resetting the reactor scram, lasted for approximately 4 minutes.

IV. CORRECTIVE ACTIONS

The immediate corrective action was for the operators to implement immediate actions for the scram in accordance with Operating Procedure N2-OP-101C, "Plant Shutdown." The unit was then stabilized in a hot shutdown condition.

Further corrective actions include:

1. A Deviation/Event Report (DER #2-93-2845) was implemented to identify and correct the cause for the low GMC flow switch actuation.

2. Flow switch 2GMC-PDS100 was replaced under a Work Order (WO #93-03003) on December 5, 1993.

IV. CORRECTIVE ACTIONS (cont.)

3. 2GMC-PDS100 will have its loop calibration frequency changed from every 6 years to an 18 month periodicity. This will aid station maintenance personnel in identifying future performance degradation, and provide for routine cycling of the switch.

4. During the next refueling outage, 2GMC-PDS100 will be removed and inspected for foreign material and the sensing lines will be flushed. These actions will be completed to verify that there is not a continued buildup of foreign material in the instrument.

5. The Chemistry Department will add filterable impurities measurement to the Stator Water Cooling sample procedure.

V. ADDITIONAL INFORMATION

A. Failed component:

Component - Stator Winding Water Lo/Lo Flow Switch
Description - Flow Switch
Mark Number - 2GMC-PDS100
Manufacturer - Dresser Industries
Component ID - 63-P82
Part Number - D420V#1273

B. Previous similar events:

There have been three previous events where a component failure caused a turbine trip and reactor scram. They are detailed in LER 89-014, LER 89-040, and LER 91-022. These previous events were caused by tubing ruptures and a relay failure in the Electro-Hydraulic Control System. The corrective actions for these previous failures would not have prevented this occurrence.

V. ADDITIONAL INFORMATION (cont.)

C. Identification of components referred to in this LER:

COMPONENT FUNCTION	IEEE 803 EIIS SYSTEM	IEEE 805 ID
Reactor Protection System	N/A	JC
Stator Water Cooling System	N/A	TJ
Electrohydraulic Control System	N/A	TG
Reactor Recirculation System	N/A	AD
Main Turbine Generator System	N/A	TA/TB
Flow Switch	FS	TJ
Pump	P	TJ
Turbine Stop Valves	ISV	TA
Turbine Control Valves	SCV	TA
Flow Indicator	FI	TJ

NIAGARA
MOHAWK

NINE MILE POINT-UNIT 2/P. O. BOX 63, LYCOMING, NY 13093

John H. Mueller
Plant Manager-Unit 2
Nuclear Generation

December 30, 1993
NMP89344

United States Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

RE: Docket No. 50-410

LER 93-12

Gentlemen:

In accordance with 10CFR50.73 W(2)(iv), we are submitting LER 93-12, "Reactor Scram Caused by a Turbine Trip Resulting from an Equipment Failure."

A telephone report of this event was made in accordance with 10CFR50.72 (b)(2)(ii) at 2105 hours on December 4, 1993.

Very truly yours,

John H. Mueller
Plant Manager - NMP2

JHM/RLM/lmc
Attachment

xc: Mr. Thomas T. Martin, Regional Administrator, Region I
Mr. Barry S. Norris, Senior Resident Inspector

*** END OF DOCUMENT ***